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**CLAIMS:**

1. An apparatus [365] in a digital video transmitter [110] for digitally encoding video signals within an overcomplete wavelet video coder [210], said apparatus [365] comprising a video coding algorithm unit [365] that is capable of locating significant wavelet coefficients in at least one cluster of significant wavelet coefficients across space and time.

2. An apparatus [365] as claimed in Claim 1 wherein said video coding algorithm unit [365] is capable of applying a three dimensional morphological significance coding technique to locate said significant wavelet coefficients.

3. An apparatus [365] as claimed in Claim 2 wherein said video coding algorithm unit [365] aligns a three dimensional structuring element [500] on a first significant wavelet coefficient that is located in a current video frame [600]; and

wherein said video coding algorithm unit [365] searches for additional significant wavelet coefficients within said three dimensional structuring element [500].

4. An apparatus [365] as claimed in Claim 3 wherein said video coding algorithm unit [365] aligns a centrally located portion of a first section of said three dimensional structuring element [500] on said first significant wavelet coefficient that is located in said current video frame [600]; and

wherein said video coding algorithm unit [365] aligns a second section of said three dimensional structuring element [500] on a next frame [610] after said current frame [600]; and

wherein said video coding algorithm unit [365] aligns a third section of said three dimensional structuring element [500] on a prior frame [620] before said current frame [600].

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5. An apparatus [365] as claimed in Claim 4 wherein said video coding algorithm unit [365] uses motion information [730] to align said second section [710] of said three dimensional structuring element [500] on said next frame [610] and uses motion information [740] to align said third section [720] of said three dimensional structuring element [500] on said previous frame [620].

6. An apparatus [365] as claimed in Claim 3 wherein said three dimensional structural element [500] comprises a rectangular shape having a length of $N_x$ in a first spatial dimension, and a length of $N_y$ in a second spatial dimension, and a length of $N_t$ in a temporal dimension; and

wherein each of said lengths $N_x$, $N_y$ and $N_t$ of said three dimensional structuring element [500] may be varied adaptively depending upon characteristics of underlying video data.

7. An apparatus [365] as claimed in Claim 6 wherein said three dimensional structuring element [500] may be divided into a plurality of sections greater than three to accommodate the use of multiple reference frames.

8. An apparatus [365] as claimed in Claim 6 wherein said three dimensional structuring element [500] is unidirectional in a temporal dimension to accommodate unidirectional motion estimation.

9. An apparatus [365] as claimed in Claim 1 wherein said video coding algorithm unit [365] is capable of locating significant wavelet coefficients in at least one cluster of significant wavelet coefficients across space and time in a direction of motion.

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10. A method for digitally encoding video signals within an overcomplete wavelet video coder [210] in a digital video transmitter [110], said method comprising the steps of:

detecting a first significant wavelet coefficient in a current video frame 600; and

locating additional significant wavelet coefficients in a cluster of significant wavelet coefficients across space and time.

11. A method as claimed in Claim 10 further comprising the step of:

applying a three dimensional morphological significance coding technique to locate said additional significant wavelet coefficients in said cluster of significant wavelet coefficients.

12. A method as claimed in Claim 11 further comprising the steps of:

aligning a three dimensional structuring element [500] on said first significant wavelet coefficient that is located in said current video frame [600]; and

searching for said additional significant wavelet coefficients within said three dimensional structuring element [500].

13. A method as claimed in Claim 12 further comprising the steps of:

aligning a centrally located portion of a first section of said three dimensional structuring element [500] on said first significant wavelet coefficient that is located in said current video frame [600]; and

aligning a second section of said three dimensional structuring element [500] on a next frame [610] after said current frame [600]; and

aligning a third section of said three dimensional structuring element [500] on a prior frame [620] before said current frame [600].

14. A method as claimed in Claim 13 further comprising the steps of:

using motion information [730] to align said second section [710] of said three dimensional structuring element [500] on said next frame [610]; and

using motion information [740] to align said third section [720] of said three dimensional structuring element [500] on said previous frame [620].

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15. A method as claimed in Claim 12 wherein said three dimensional structural element [500] comprises a rectangular shape having a length of $N_x$ in a first spatial dimension, and a length of $N_y$ in a second spatial dimension, and a length of $N_t$ in a temporal dimension; and said method further comprises the step of:

adaptively varying each of said lengths $N_x$, $N_y$ and $N_t$ of said three dimensional structuring element 500 depending upon characteristics of underlying video data.

16. A method as claimed in Claim 15 further comprising the step of:

dividing said three dimensional structuring element [500] into a plurality of sections greater than three to accommodate the use of multiple reference frames.

17. A method as claimed in Claim 15 wherein said three dimensional structuring element [500] is unidirectional in a temporal dimension to accommodate unidirectional motion estimation.

18. A method as claimed in Claim 10 further comprising the step of locating significant wavelet coefficients in at least one cluster of significant wavelet coefficients across space and time in a direction of motion.

19. A digitally encoded video signal generated by a method for digitally encoding video signals within an overcomplete wavelet video coder [210] in a digital video transmitter [110], said method comprising the steps of:

detecting a first significant wavelet coefficient in a current video frame 600; and

locating additional significant wavelet coefficients in a cluster of significant wavelet coefficients across space and time.

20. A digitally encoded video signal as claimed in Claim 19 wherein said method further comprises the step of:

applying a three dimensional morphological significance coding technique to locate said additional significant wavelet coefficients in said cluster of significant wavelet coefficients.

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21. A digitally encoded video signal as claimed in Claim 20 wherein said method further comprises the steps of:

aligning a three dimensional structuring element [500] on said first significant wavelet coefficient that is located in said current video frame [600]; and

searching for said additional significant wavelet coefficients within said three dimensional structuring element [500].

22. A digitally encoded video signal as claimed in Claim 21 wherein said method further comprises the steps of:

aligning a centrally located portion of a first section of said three dimensional structuring element [500] on said first significant wavelet coefficient that is located in said current video frame [600]; and

aligning a second section of said three dimensional structuring element [500] on a next frame [610] after said current frame [600]; and

aligning a third section of said three dimensional structuring element [500] on a prior frame [620] before said current frame [600].

23. A digitally encoded video signal as claimed in Claim 22 wherein said method further comprises the steps of:

using motion information [730] to align said second section [710] of said three dimensional structuring element [500] on said next frame [610]; and

using motion information [740] to align said third section [720] of said three dimensional structuring element [500] on said previous frame [620].

24. A digitally encoded video signal as claimed in Claim 21 wherein said three dimensional structural element [500] comprises a rectangular shape having a length of $N_x$ in a first spatial dimension, and a length of $N_y$ in a second spatial dimension, and a length of $N_t$ in a temporal dimension; and said method further comprises the step of:

adaptively varying each of said lengths $N_x$, $N_y$ and $N_t$ of said three dimensional structuring element [500] depending upon characteristics of underlying video data.

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25. A digitally encoded video signal as claimed in Claim 22 wherein said method further comprises the step of:

dividing said three dimensional structuring element [500] into a plurality of sections greater than three to accommodate the use of multiple reference frames.

26. A digitally encoded video signal as claimed in Claim 22 wherein said three dimensional structuring element [500] is unidirectional in a temporal dimension to accommodate unidirectional motion estimation.

27. A digitally encoded video signal as claimed in Claim 19 wherein said method further comprises the step of locating significant wavelet coefficients in at least one cluster of significant wavelet coefficients across space and time in a direction of motion.